3.3 Refractive Index Fiber Analysis

3.3.1 Introduction

The determination of the physical and optical properties of a fiber is sufficient to identify the natural fibers and is a preliminary step in identifying the man-made fibers.

3.3.2 Safety Considerations

Standard Laboratory Precautions.

Chemical	NFPA
Cargille Liquids	3-2-2

3.3.3 Preparations

Standard Laboratory Practices.

3.3.4 Minimum Standards & Controls

Natural fibers for comparison shall be identified as to generic class and compared using polarized light microscopy and/or brightfield microscopy.

Man-made fibers for comparison shall be identified as to generic class and compared using polarized light microscopy, brightfield microscopy, and at least one more identification technique such as solubility tests, refractive index determination, melting point determination or FTIR.

3.3.5 Instrumentation

Brightfield microscope.

Polarized light microscope.

3.3.6 Procedure or Analysis

Refer to **Appendix 3.3 A**: Use the Flowchart for Identification of Common Synthetic Fibers

A **fiber worksheet** can be utilized to aid in the comparison and organization of microscopic qualities.

3.3.7 References

Catling, D.; Grayson, J. Identification of Vegetable Fibers; Chapman & Hall: New York, 1982.

Robertson, J., Ed. Forensic Examination of Fibers; Ellis Horwood: New York, 1992.

Textile Institute. Identification of Textile Materials, 7th ed.; Textile Institute: Manchester, England, 1975.

Scott F. Stoeffler, M.S.F.C., A Flowchart System for the Identification of Common Synthetic Fibers by Polarized Light Microscopy; Journal of Forensic Science, JFSCA, Vol. 41, No. 2 March 1996, pp. 297-299.